Listing of the Claims

1.   (Original) A method for oxidizing a layer (36),

comprising the following steps, carried out without restriction in the order indicated:

providing a substrate (14), which bears a layer (36) which is to be oxidized,

the layer (36) which is to be oxidized being part of a layer stack (16) which includes the substrate (14) or a base layer (32) at a base surface of the layer (36) which is to be oxidized, and a neighboring layer (34) which adjoins that surface of the layer (36) to be oxidized which is remote from the base surface,

and the layer (36) which is to be oxidized being uncovered in an edge region of the layer stack (16),

introducing the substrate (14) which bears the layer stack (16) into a heating device (80),

passing an oxidation gas onto the substrate (36),

heating the substrate (36) to a process temperature, the layer (36) which is to be oxidized, as the oxidation time continues, being oxidized ever further from its edge into the layer stack (16) under the influence of the oxidation gas at the process temperature,

recording the process temperature during the processing via the temperature of a holding device (110) which holds the substrate (14),

and controlling (152) the temperature of the substrate (14) to a predetermined desired temperature or a predetermined desired temperature curve during the processing.

2.   (Original) The method as claimed in claim 1, wherein a main surface of the substrate (14) bears parallel against a main surface of the holding device (110) or is arranged at a distance of less than three millimeters or less than one millimeter or less than 0.5 millimeter,

and/or wherein 10°C deviation in the process temperature causes the oxidation width (W) to deviate by more than 5% or by more than 10% or by more than 200from a desired oxidation width,

and/or wherein the layer (36) which is to be oxidized contains a semiconductor material, preferably gallium arsenide, which is doped with a metal, preferably with aluminum,

and/or wherein the substrate (14) contains gallium arsenide,

and/or wherein the layer (36) which is to be oxidized is arranged between two layers (32, 34) which are not to be oxidized during the processing, preferably between two layers (32, 34) which contain gallium arsenide,

and/or wherein the process temperature is between 100°C and 500°C,

and/or in which the oxidation width (W) is decisively dependent on the process temperature,

and/or in which the substrate (14) is processed in a single-substrate process in the heating device (80).

3.   (Original) The method as claimed in claim 1 or 2, wherein the thermal conductivity of the holding device (110) at 20°C is greater than 10 $Wm^{-1}K^{-1}$, preferably greater than 100 $Wm^{-1}K^{-1}$,

and/or wherein the and/or wherein the thermal conductivity of the holding device at the process temperature is greater than the thermal conductivity of the substrate (14) at the process temperature,

and/or wherein the holding device (110) contains graphite, preferably coated graphite.

4.   (Original) The method as claimed in one of the preceding claims, wherein a heat-up time of the heating device (80) from the start (t0) of the heating operation until the process temperature is reached is less than five minutes,

the process temperature preferably being between 350°C and 450°C,

and a temperature of less than 50°C prevailing in the heating device (80) at the start (t0, tOa) of the heating operation,

and/or wherein the residence time of the substrate (14) in the heating device (80) is less than fifteen minutes or less than 10 minutes.

5.   (Original) The method as claimed in one of the preceding claims, wherein during the heating of the substrate (14) to the process temperature at least one preheating step (t1a) is carried out, in which the temperature in the heating device (80) is held at a preheating temperature, which is lower than the process temperature and higher than a condensation temperature of the oxidation gas or a gas which has been admixed with the oxidation gas, for at least ten seconds or least thirty seconds,

and wherein the oxidation gas starts to be admitted to the heating device (80) before the preheating temperature is reached or at the preheating temperature.

6.   (Original) The method as claimed in one of the preceding claims, wherein the holding device (110) is covered by a cover (116),

and/or wherein the cover (116) rests on an edge (122) of the holding device (110) or is held at a predetermined distance from the edge (122).

7.   (Original) The method as claimed in one of the preceding claims, wherein the substrate (14) has a circular base surface,

and wherein the holding device (110), in the circumferential direction of the substrate (14), has a recess (130) into which a preferably exchangeable ring (128) made from a material which is

preferably different than the material of the holding device (110) is placed,

and wherein the heating device (80) includes straight heating elements (86 to 104) or spot-like heating elements.

8.   (Original) The method as claimed in one of the preceding claims wherein the heating device (80) is suitable for heating rates of greater than 8°C per second,

wherein the layer stack (16) includes a layer (46) whose edge projects beyond the stack (16), preferably a contact-making layer, the contact-making layer preferably containing gold, and wherein the heating-up to process temperature is carried out at a heating rate of less than 6°C per second or less than 3°C per second.

9.   (Original) The method as claimed in one of the preceding claims, wherein the oxidation is interrupted (202) before a desired oxidation width (W1) is reached,

wherein the oxidation width (W1) is recorded,

and wherein a post-oxidation of the layer which is to be oxidized is carried out (206) as a function of the recorded oxidation width (W1).

10.   (Original) The method as claimed in one of the preceding claims, wherein the oxidation gas contains oxygen in a form bonded to at least one other element, preferably bonded in H2O molecules,

and wherein the level of molecular oxygen during processing is less than 1%.

11.	(Original) The method as claimed in one of the preceding claims, wherein the temperature is recorded using a pyrometer (134) or using at least one thermocouple (154).

12.	(Original) The use of the method as claimed in one of the preceding claims for fabricating an electronic component (10) with electrical contacts (46),

the contact resistance of the contact (46) being less than 5 times 10-6 Q /CM-2 or less than 4 times 10^{-6} Ω/cm^{-2},

or the contact resistance being lower than the contact resistance which is produced in a conventional furnace process using otherwise identical materials,

and/or for producing an integrated vertical laser unit (10).

13.	(Withdrawn) A holding device (110), in particular for carrying out the method as claimed in one of the preceding claims,

having a flat base body which contains graphite,

and having a recess (124) which is matched to a substrate (114),

which holding device includes an outer coating.

14.	(Withdrawn) The holding device (110) as claimed in claim 13, wherein the coating contains graphite which has preferably been applied using a CVD process.

15.   (Withdrawn) A holding device (110), in particular for carrying out the method as claimed in one of claims 1 to 12,

having a flat base body,

having a recess (124) which is matched to a substrate (114),

which holding device includes a recess, which runs in the circumferential direction of the recess (124) for holding the substrate (114), for an exchangeable ring (128).

16.   (Withdrawn) The holding device (110) as claimed in claim 15 and associated rings, wherein the holding device (110) contains graphite, and wherein there are at least two rings made from different materials, preferably one ring which contains silicon and/or one ring which contains silicon carbide and/or one ring which contains quartz and/or one ring which contains gallium arsenide.

17. (Withdrawn) The holding device (110) as claimed in claim 15 or 16 and associated rings (128), wherein there are at least two rings of different thickness.